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computing services

ComputerNews

Micro Repair Service 978-5471
Micro Lab Bookings 978-5601
UTCS
Advising 10-6 Mon-Fri 978-HELP
Information Office 978-4990
Accounting Office 978-7148

Putting it together...

A Guide to UTCS

ALSO INSIDE

- 486 Power
- New FAX Service
- 35mm Slides on Mac
- SAS on a SUN Workstation

ISSN 0315-4661 September 1989 No. 257

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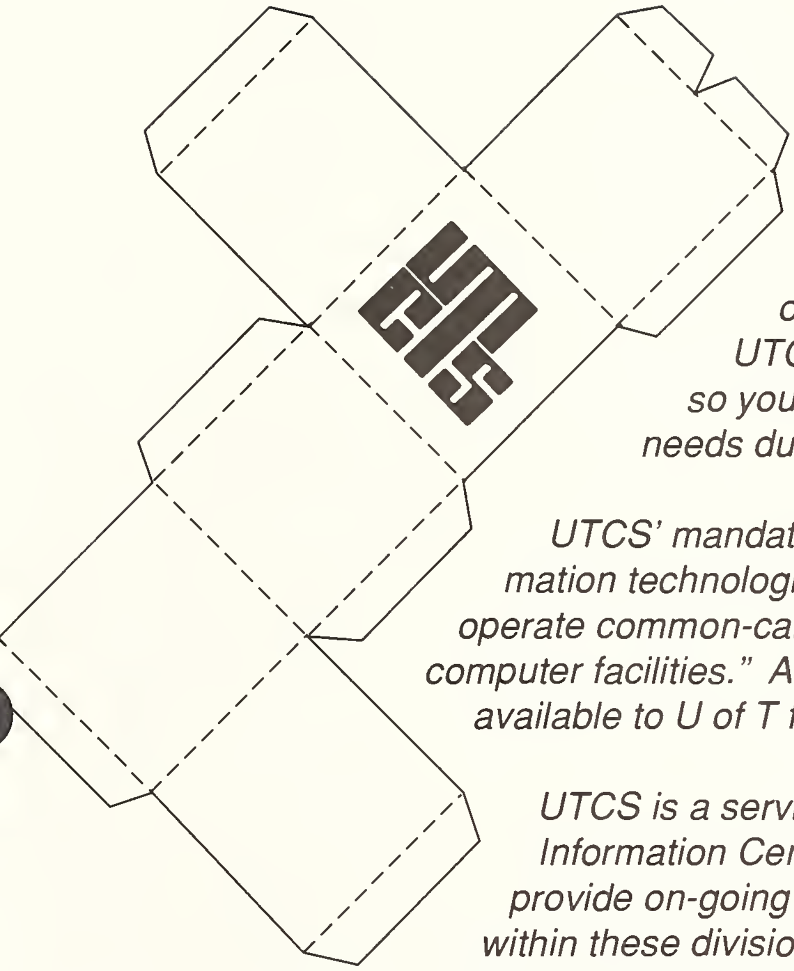
Putting it Together... A Guide to UTCS



Welcome to University of Toronto Computing Services (UTCS). This issue of ComputerNews, like each September issue, provides an overview of the various groups that make up UTCS. We hope you'll keep this issue for reference, so you'll know whom to contact for all your computer needs during the coming year.

UTCS' mandate is "to encourage and support the use of information technologies across campus, and to plan, implement, and operate common-carrier networks and certain appropriate central computer facilities." All of the department's facilities and services are available to U of T faculty, staff, and graduate students.

UTCS is a service-oriented department. Two divisions, the Information Centre and Communications and Technical Support, provide on-going support to computer users; different groups within these divisions focus on specific types of hardware or software. The Accounting Office, which is part of the Internal Systems division, administers users' accounts. Together, these user-oriented groups offer just about all the computer-related services you're likely to need, whether you're an experienced user or a newcomer to the world of computers.

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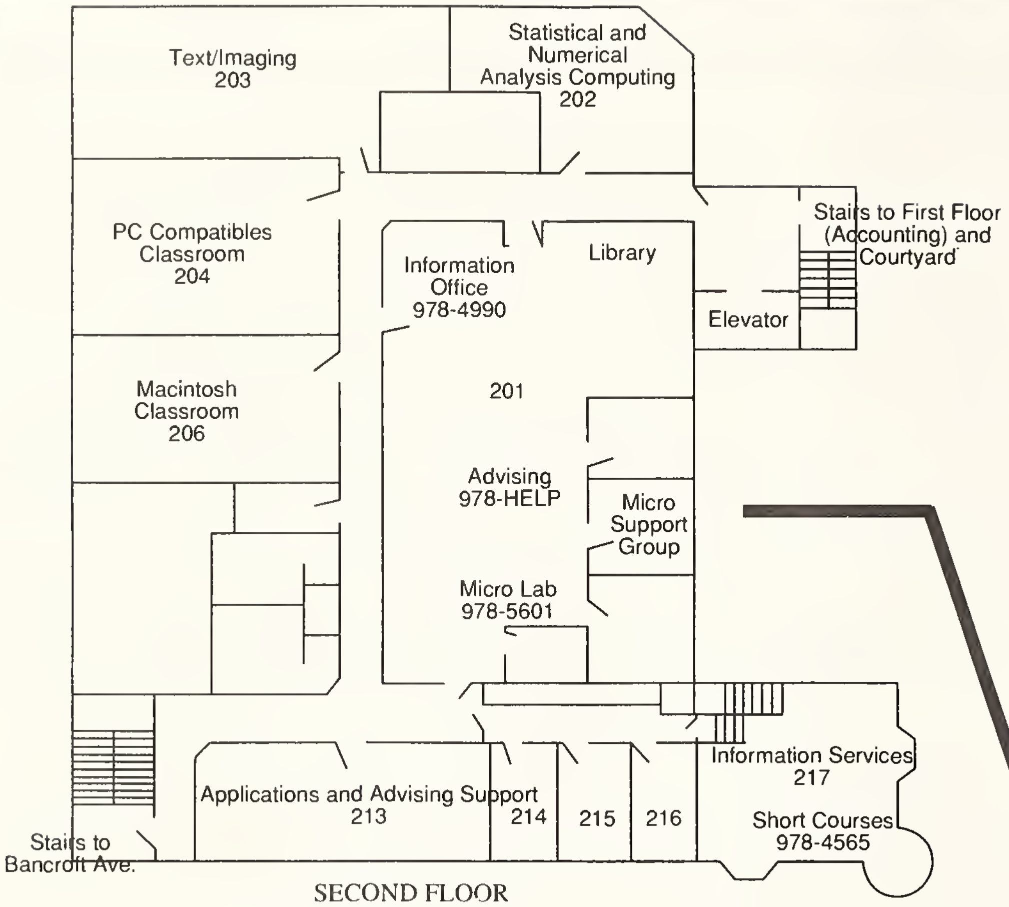
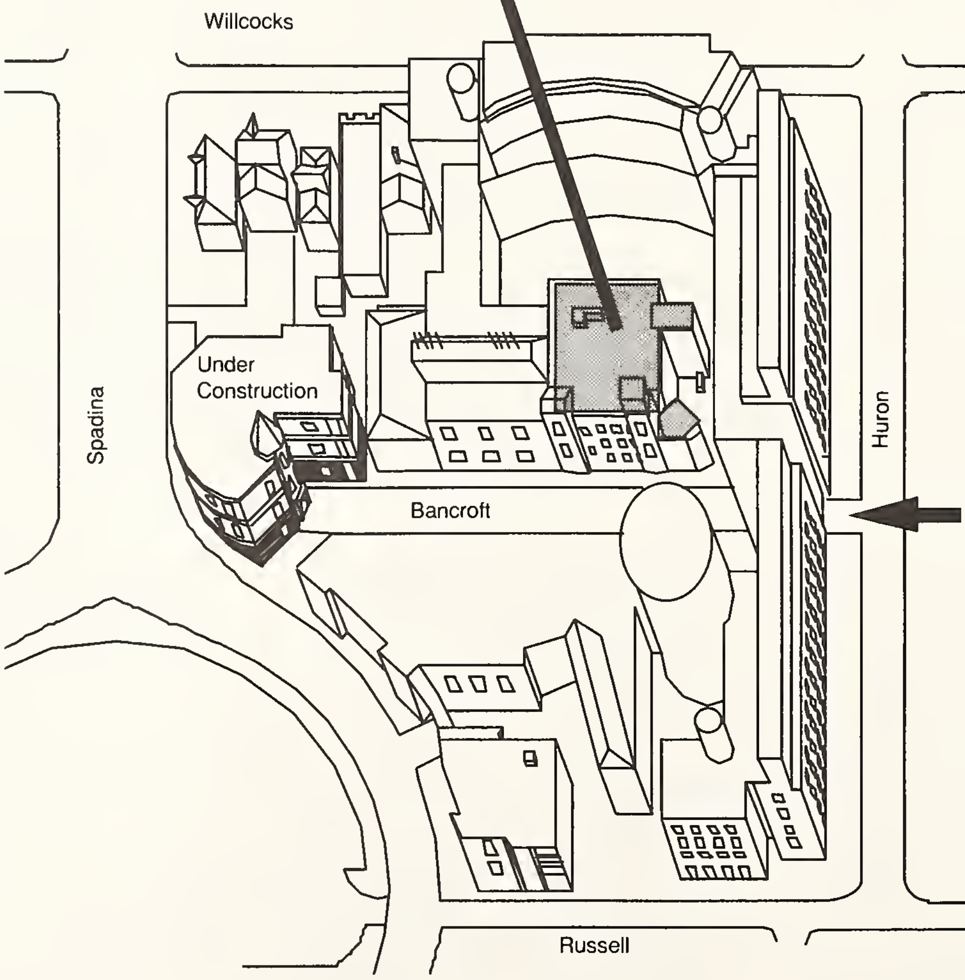


SECOND FLOOR
4 Bancroft Ave.

UTCS occupies 4 Bancroft Avenue, First and Second Floors. Bancroft is located off Huron between Russell and Willcocks. There is no parking on Bancroft and no entrance from Spadina. Our offices are wheelchair accessible.

The Information Centre

The Information Centre is composed of six groups: Applications and Advising Support (which includes Central Advising), Information Services, the Marketing Representative, the Microcomputer Support Group (MSG), the Statistical and Numerical Analysis Computing (SNAC) group, and Text/Imaging. These groups provide a wide variety of services, ranging from microcomputer courses to media conversion, from the installation of networks to custom programming for Humanities disciplines.



Applications and Advising Support answers inquiries about electronic mail, terminal emulators, application development tools, and operating systems.

Applications and Advising Support

How can we help?

Applications and Advising Support provides the following services to the U of T community:

Electronic mail
- provides help in acquiring packages
- provides assistance with sending e-mail via local and international networks

Terminal emulators
- answers questions about ProComm and Kermit (for Mac and PC)
- distributes ProComm and Kermit (for Mac and PC)

Application development tools
- solves user problems with such languages as Pascal, C, and FORTRAN
- sells WATFOR/77 and WATCOM C annual licenses for PC users

Operating systems
- provides assistance with command languages
- solves problems with operating systems such as PC DOS, Mac OS, UNIX, NeXT, etc.

To use the service, call:

978-HELP.

Hours of service:

Monday through Friday, 10:00 to 6:00.

Restrictions on use:

Restricted to U of T faculty, graduate students, cross-appointed researchers, and staff.

Cost of service:

Free.

Just ask us ...

Q: I just bought a modem for my PC and I got ProComm from you. Why doesn't my setup work?

A: Make sure your modem is wired up correctly. If it is, check the modem settings and the ProComm "setup" parameters. If everything is set up properly but your system still doesn't work, call 978-HELP for further advice.

Q: We have a Macintosh network in our area and we want to exchange electronic mail. Is there a package to do this?

A: Yes. UTCS has copies of Microsoft Mail and CE Software Quickmail for evaluation, and can sublicense Quickmail at an attractive price. Also, sometime this fall UTCS will be offering a gateway facility allowing Macintosh Quickmail users access to international research computer networks.

Q: I'm planning to write a program for use in my department. What language should I use, and what tools could assist me?

A: UTCS has evaluation copies, for both Mac and PC, of major languages like C, FORTRAN, and Pascal, as well as experience using these languages on personal computers, minis, and mainframes. We also have debugging tools that you can evaluate. The Applications and Advising Support Group can help you decide which tools are applicable.

For more information about this group, call:

Alex Nishri (978-7109).

Advising provides advising/consulting on command languages, high-level languages, editors, communications packages, and operating systems for PC and Macintosh microcomputers and for CMS and UNIX mainframe systems.

Central Advising

How can we help?

Central Advising provides the following services to the U of T community:

- supports computer inquiries about software and hardware use and problems
- answers short technical questions in five minutes or less
- sets up appointments with a consultant or specialist if the problem/question requires more time
- distributes software: ProComm for PC, PC/MacKermit, anti-virus programs, U of T crest

To use the service, call:

978-HELP.

Location:

4 Bancroft Avenue, Room 201.

Hours of service:

Monday through Friday, 10:00 to 6:00.

Restrictions on use:

With the exception of phone-in services, which are available to undergrads, services are restricted to U of T faculty, graduate students, cross-appointed researchers, and staff.

Cost of service:

Free.

Just ask us ...

Q: My program/application is not performing a feature as expected.
A: We may be able to explain why a feature works the way it does for your setup. If we need to, we can simulate your situation, since we have the hardware (PC, Mac, and mainframe links) and the software at the HELP desk.

Q: I deleted my file by accident. *or* I have a file my application won't retrieve/open. *or* I have a bad disk.
A: We have the knowledge and the access to Mac and PC utilities that can assist you in recovering deleted and corrupted files. If you need to, you can come to the HELP desk and an advisor will assist you. However, there is no assurance that your files or disks are recoverable.

Q: How do I send send electronic mail to a colleague?
A: We will show you the e-mail alternatives, and how to get mail to your colleague.

For more information about this group, call:

Reinhard Schuller, 978-6878.

Information Services provides Information Office and Microcomputer Lab services, administers and teaches short courses, and publishes ComputerNews.

Information Services

How can we help?

Information Services provides the following services to the U of T community:

Microcomputer Lab
- laser printing, scanning, typesetting, document conversion, and slide-making services by appointment
- software demonstrations
- the NeXT computer
- FAX service

Information Office
- licenses and/or sells microcomputer software and computer-related documentation
- redirects general queries to most suitable consulting group
- maintains a library of computer-related periodicals

Education Services
- schedules and administers Short Courses on microcomputer software
- two classrooms: PC and Macintosh
- maximum of 10 students per class
- courses for departments taught on request

ComputerNews
- published 8 times each year
- free subscriptions on request
- contains discussions, news, and reviews of computing issues and software of particular interest to the members of the University of Toronto

Location:

4 Bancroft Avenue, Room 201.

To use the service, call:

ComputerNews:	978-4034
Information Office:	978-4990
Microcomputer Lab:	978-5601
Short Courses:	978-4565
FAX:	978-7159

Hours of service:

Monday through Friday, 8:45 to 5:00.
Micro Lab 8:45 to 6:00 (5:00 to 6:00 by appointment only).

Restrictions on use:

Generally, our services are for the use of U of T faculty, graduate students, cross-appointed researchers, and staff. External customers pay higher fees for courses; Microcomputer Lab use is available by special arrangement.

Cost of service:

Depends on service. Contact the specific service using the telephone numbers above.

Just ask us ...

Q: Do you sell software?

A: The Information Office sells the text processing package Nota Bene, and it licenses, on a yearly basis, the statistical packages SAS, SPSS, and SYSTAT. Yearly licenses are also available for WATFOR/77 and WATCOM C. A site license for Archivist, a text management program, is available as well. These software packages are available to members of the U of T community only.

Q: Can you tell me what courses you offer, when they are, and what they cost?

A: We offer 15 short courses, scheduled throughout the year. Very popular courses, such as Introduction to WordPerfect, may be offered twice a month, while more advanced courses, such as Intermediate SAS, may be offered once each quarter. Cost is based on the number of hours of instruction time. Courses span from 4 to 16 hours. See "Microcomputer Courses", elsewhere in this issue, for more specific information.

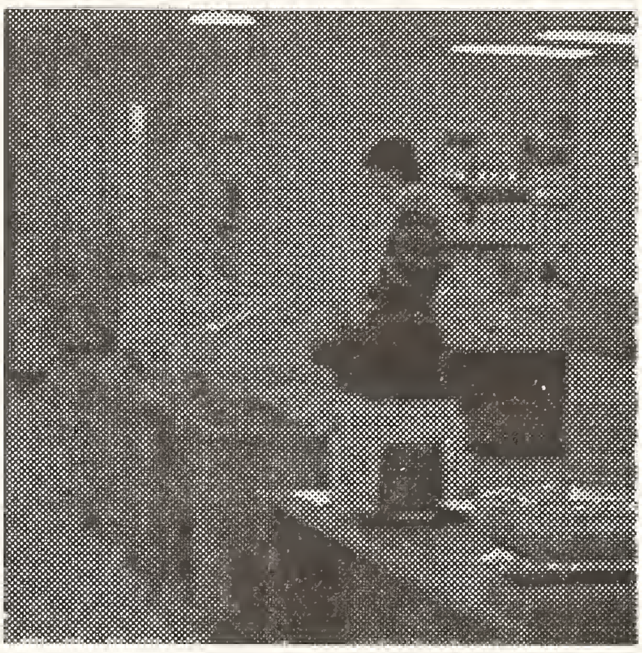
Q: How can I get on the mailing list for ComputerNews?

A: Send your complete mailing address (preferably a campus mail address), including building and room number, to:

ComputerNews
4 Bancroft Ave, Room 217
Toronto, Ontario
M5S 1C1.

For more information about this group, call:

Patricia Hood, 978-2066.



978-HELP: Phone-in advising from 10:00 to 6:00 Monday through Friday

The UTCS Microcomputer Lab

The Marketing Representative assists external users in using UTCS mainframe and micro-computer services.

Marketing Representative

How can I help?

The Marketing Representative provides the following services to the U of T community:

- describes UTCS mainframe/micro services
- assists users with opening accounts
- resolves billing issues
- advises on questions with Lotus and Excel
- teaches UTCS noncredit short courses on Lotus and Excel

To use the service, call:

Ihor Prociuk (978-6875).

Location:

4 Bancroft Avenue, Room 312A.

Hours of service:

Monday through Friday, 8:45 to 5:00.

Restrictions on use:

Services are provided to organizations affiliated with U of T and to other organizations (e.g., government and commercial) who cannot find equivalent services elsewhere.

Cost of service:

For cost information, see the rate schedules in the UTCS Accounting Office.

Just ask me ...

Q: How do I open an account with UTCS?

A: Discuss your requirements with the Marketing Representative, who will mail you the appropriate forms. Return these forms along with a covering letter indicating how you would like to be billed.

Q: Can you explain my on-line (storage) charges on CMS?

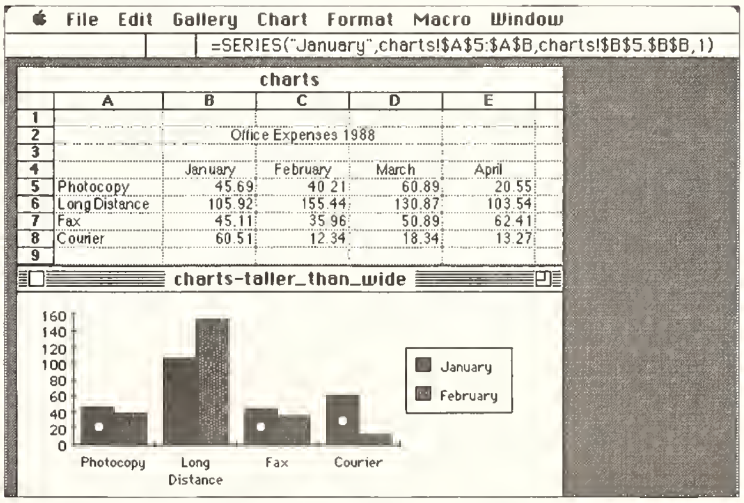
A: As the account holder, you tell CMS how much on-line space you want to reserve for your work. UTCS then bills you for the amount of space you reserve.

Q: Why did my formula change when I copied it to another part of my worksheet in Excel?

A: When you copy a formula, Excel adjusts the copied formula so that it has the same relative address references as the original.

For more information about this group, call:

Ihor Prociuk (978-6875).



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charts

	A	B	C	D	E
1					
2			Office Expenses 1988		
3					
4		January	February	March	April
5	Photocopy	45.69	40.21	60.89	20.55
6	Long Distance	105.92	155.44	130.87	103.54
7	Fax	45.11	35.96	50.89	62.41
8	Courier	60.51	12.34	18.34	13.27
9					

Excel charting example used in teaching.

The Microcomputer Support Group supports microcomputer services related to microcomputer hardware, systems software, and applications software.

Microcomputer Support Group

How can we help?

The Microcomputer Support Group provides consulting and information to the U of T community on:

- the selection of microcomputer systems, including IBM PCs and compatibles, Apple Macintoshes, and personal workstations
- the selection of peripheral equipment and accessories, such as modems, hard disk drives, controllers, projection panels, and surge suppressors
- certain application software, such as database languages, operating systems, and system utilities
- Local Area Network hardware and operating systems
- new computer hardware (we publish evaluations in ComputerNews)

These services are available both to individuals on campus and to University departments.

To use the service, call:

978-HELP.

Location:

4 Bancroft Avenue, Room 201.

Hours of service:

Monday through Friday, 8:45 to 5:00.

Restrictions on use:

Restricted to U of T faculty, graduate students, cross-appointed researchers, and staff.

Cost of service:

Free.

Just ask us ...

Q: What type of microcomputer should I buy?

A: There's no simple answer to this question, since so many factors are involved. The Microcomputer Support Group will help you clarify your needs and will recommend solutions based on such considerations as power, portability, compatibility with other devices, cost, and the type of work you'll be doing.

Q: How do we connect our machines so that we can share data, peripherals, and so on?

A: There are numerous methods for sharing computer resources such as printers. The Microcomputer Support Group can help you determine the most efficient and cost-effective way, whether it be installing a Local Area Network or simply buying cables.

Q: I have a large amount of research data to organize. What kind of computer package should I use?

A: A database is probably the type of program you'll need. Depending on the way you want to look at your data, you may need just a simple, *flat* database, or you may require a more complex, *relational* database package. Discuss your requirements and preferences with a member of the Microcomputer Support Group, who can help you decide which package best suits your needs.

For more information about this group, call:

Terry Sanderson (978-4597).

The SNAC Group tests and supports software for data and numerical analysis on microcomputers, minicomputers, and mainframes.

Statistical and Numerical Analysis (SNAC) Group

How can we help?

The SNAC Group provides the following services to the U of T community:

Software Licenses

- maintains site licenses for a variety of statistical and numerical packages (e.g., SAS, SPSS, SYSTAT)
- arranges for licenses for new products of significant interest to the University

Consultation

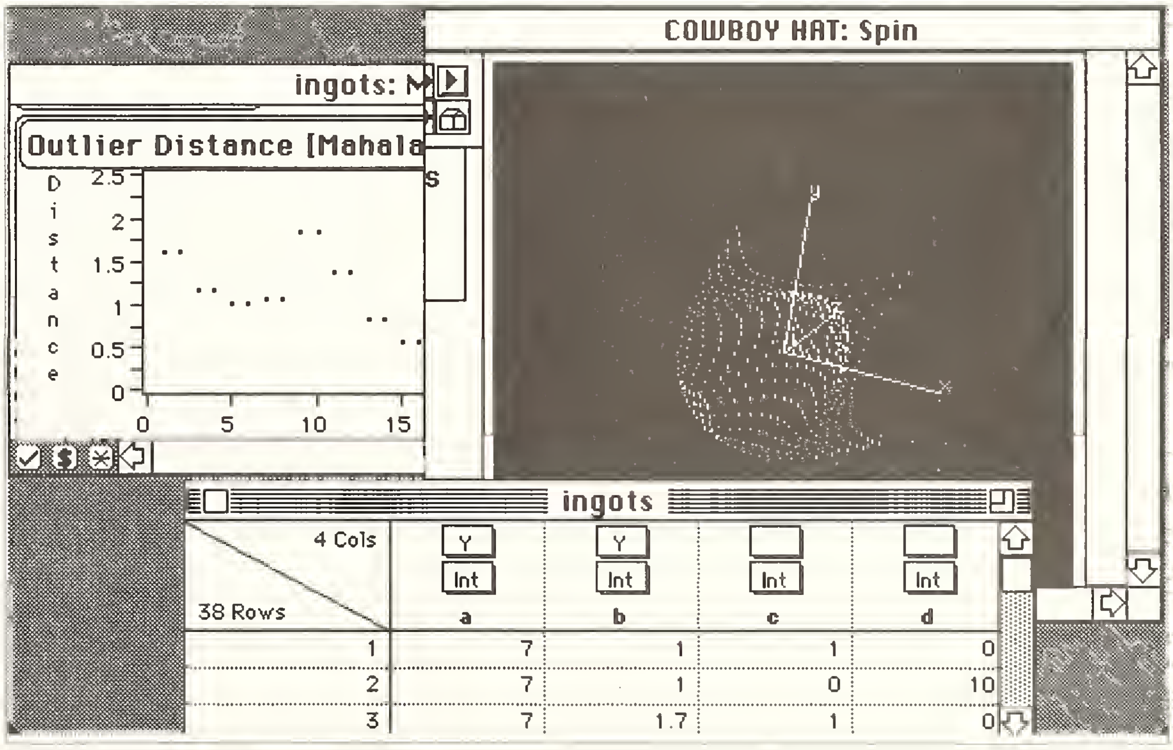
- answers questions on the use of statistical and numerical packages
- discusses available packages suitable for solving particular problems
- assists with transferring data from one package to another

Education

- teaches short courses on statistical packages
- reports on techniques and new facilities in ComputerNews

Research

- investigates new products available for data and numerical analysis
- acquires test versions of new products for evaluation
- investigates new environments for existing products, and better methods for data interchange between them



4 Cols 38 Rows	Y Int a	Y Int b	Int c	Int d
1	7	1	1	0
2	7	1	0	10
3	7	1.7	1	0

Demo of JMP, a new statistical software package for the Macintosh

To use the service, call:

978-HELP.

Location:

4 Bancroft Avenue, Room 202.

Hours of service:

Monday through Friday, 8:45 to 5:00.

Restrictions on use:

Restricted to U of T faculty, graduate students, cross-appointed researchers, and staff.

Cost of service:

The cost depends on the service; contact the group number for details.

Just ask us ...

Q: Can SAS use the extra memory on my PC?

A: Yes. SAS can make use of expanded memory when "—EMS ALL" is included in the CONFIG.SAS file. Extended memory must be configured as expanded memory to be used by SAS.

Q: Can I do statistical analysis on the Macintosh?

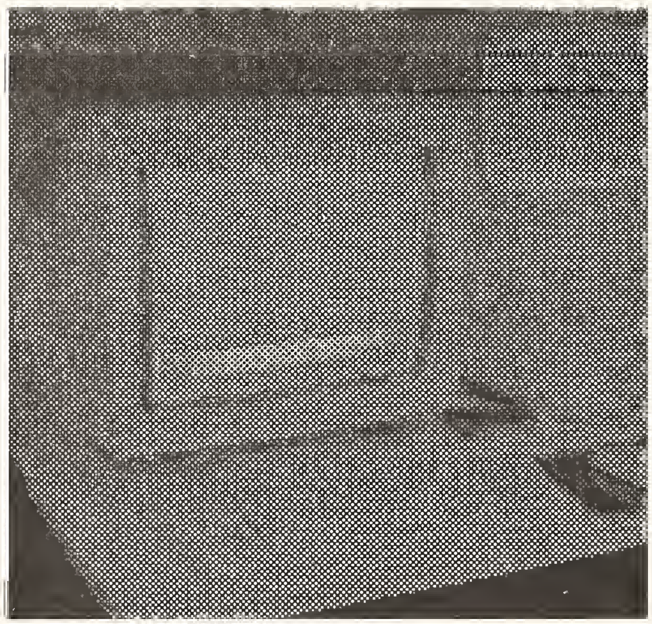
A: Yes. UTCS licenses SYSTAT for the Mac. We are currently beta testing JMP, which is a data presentation system for the Macintosh, developed by SAS. Other packages are also available. To inquire about site licenses, contact the Information Office at 978-4990.

Q: Are there analysis packages available for UNIX?

A: Yes. We license SAS for the SUN workstation, among others. (Call the Information Office at 978-4990 for information on obtaining a site license.) A variety of public domain packages also exist which can be run on UNIX for little cost.

For more information about this group, call:

Barry Lay (978-6509).



SUN Workstation

The Text/Imaging Support Group assists users in the folowing computer-related areas: text processing and manuscript preparation, desktop publishing, computer graphics and imaging, and electronic presentations.

Text/Imaging Support Group

How can we help?

The Text/Imaging Group provides the following services to the U of T community:

- answers questions about word processing, graphics, and desktop publishing software for the Mac and the PC
- investigates new areas (currently developing support for bibliographic databases, mathematical word processors, and hypermedia)
- works with the University's *Centre for Computing in the Humanities* to develop software that can be used by various Humanities disciplines (for example, a current project is the development of TACT, a sophisticated text-retrieval system for the IBM PC)
- works with departments within the University to generate computer-presented material using "electronic publishing" technologies such as CD-ROM and hypermedia

To use the service, call:

978-HELP.

Location:

4 Bancroft Avenue, Room 203.

Hours of service:

Monday through Friday, 8:45 to 5:00.

Restrictions on use:

Restricted to U of T faculty, graduate students, cross-appointed researchers, and staff.

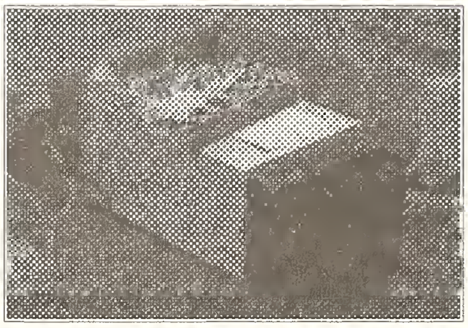
Cost of service:

Free to the above community.

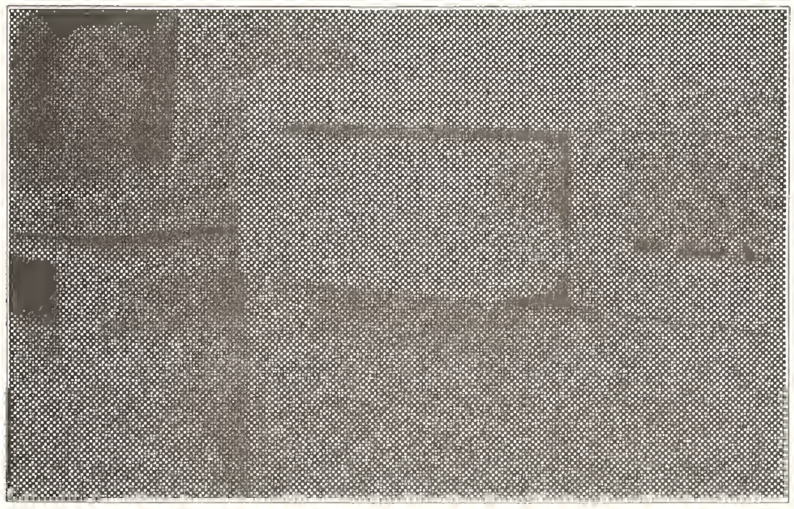
Just ask us ...

Q: My word processor / desktop publishing program / printer isn't performing as I expected.

A: We may be able to explain why the feature works as it does, perhaps by identifying some aspect of the setup on your machine that might be causing problems. If you've found a bug, we can deal with the vendor to get assistance.



Micro Lab equipment: Palette slidemaker, Linotype typesetter.



Q: I want to start some new operation, such as desktop publishing. What software and hardware do I need?

A: We will review your needs and expectations, and discuss your alternatives with you. We can also let you try out various machines and programs that we have available.

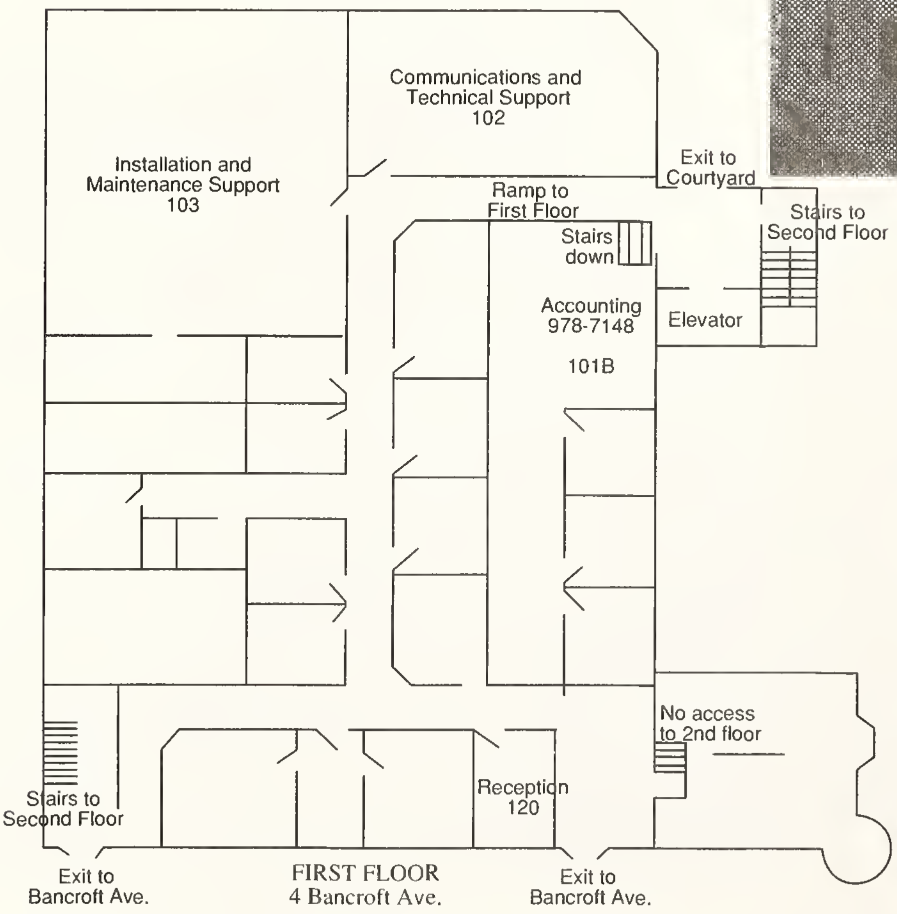
Q: I want to start using some feature of my software that I haven't used before.

A: We can introduce you to parts of your software that you currently don't use, and explain when and how you can put them to work for you. In some cases, UTCS short courses, such as Advanced WordPerfect, may best suit your needs.

For more information about this group, call:

John Bradley (978-3995).

The Director, Associate Director, Internal Systems Support staff (including Accounting Services), and the Communications and Technical Support Staff occupy the first floor of 4 Bancroft Avenue. Use the east entrance (closest to Huron Street).



Accounting Services maintains customer accounts and Service Access Codes (SACs) for VM/CMS and GP UNIX, and handles monthly customer billing.

Accounting Services

How can we help?

Accounting Services provides the following services to the U of T community:

- assists users in opening, maintaining, and closing accounts
- addresses account inquiries
- bills for services/software received

To use the service, call:

Sylvia May (978-7148).

Location:

4 Bancroft Avenue, Room 100B.

Hours of service:

Monday through Friday, 9:00 to 12:00 and 1:00 to 5:00.

Restrictions on use:

Personal, prepaid accounts are restricted to U of T faculty, graduate students, cross-appointed researchers, and staff.

Cost of service:

See the rate schedules in the UTCS Accounting Office.

Just ask us ...

Q: Why am I locked out of the system?

A: Prepaid funds have been exhausted, *or* an Encumbrance Memo account has been depleted, *or* invoices have not been paid, *or* the account owner has requested a special spending limit for this user.

Q: What is an Encumbrance Memo?

A: To access UTCS mainframe services, University customers must supply a blanket order called an Encumbrance Memo. It is an University internal blanket Purchase Order, the amount of which sets a spending limit for the account; it also allows UTCS to bill accounts without issuing a Debit Memo. Other services can be charged through a Debit Memo. External customers must prepay for services unless they are eligible to be billed through a monthly invoice.

Q: How can I transfer my data from my micro to your mainframe, and vice versa?

A: Phone Advising at 978-HELP for information on how to do this.

For more information about this group, call:

Marg Doherty (978-8697).

The Communications and Technical Support division supports a wide variety of data communications systems and technologies on campus.

Communications and Technical Support

How can we help?

Communications and Technical Support provides the following services to the U of T community:

- architects, designs, and implements campus data communications services
- provides solicited recommendations regarding computer systems, personal computers, and Local Area Networks (LANs)
- installs and supports many LAN technologies (e.g., Novell, Appletalk, Tapestry LAN Manager, PC LAN, PC NFS)

To use the service, call:

Tom Currie (978-4624) or Tom Milligan (978-6134).

Location:

4 Bancroft Avenue, Room 102 or 121B.

Hours of Service:

Monday through Friday, 8:45 to 5:00.

Restrictions on Use:

Services are available to U of T faculty and staff, and to external organizations as arranged.

Cost of Service:

The cost will be arranged. Advice is provided at no charge.

Just Ask Us ...

Q: What do I need in order to get access to the FELIX library system from my office?

A: Any simple workstation (a VT100 terminal or a personal computer emulating one) and a data link to PACXnet would be satisfactory.

Q: Can I use the telephone network from my campus office computer to get to public databases (e.g., FP Online)?

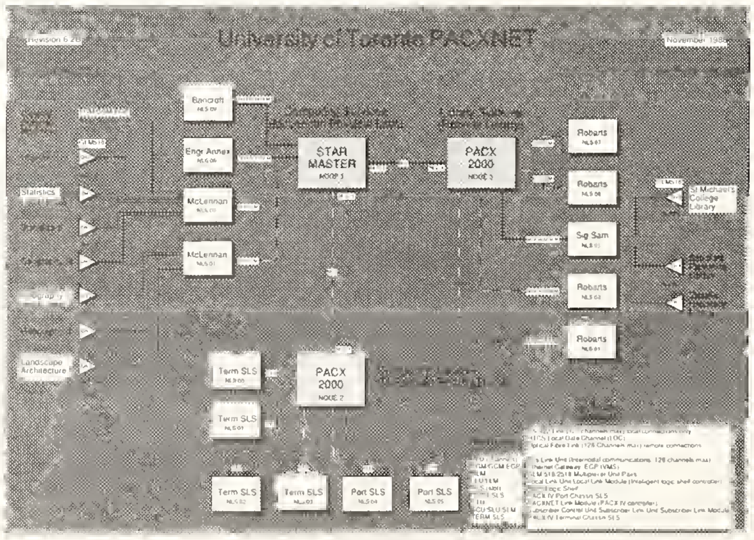
A: Yes. A connection to PACXnet allows local calling to the telephone system and hence to FP Online.

Q: I have an IBM Token Ring LAN. Can this be connected to the campus Token Ring Backbone?

A: The method by which this is done is technologically quite standard, although the costs may vary considerably. Most of these costs are funded by the University by allocation to UTCS via the normal University budget process, and are prioritized according to perceived importance.

For more information about this group, call:

Norman Housley (978-4967).



Installation and Maintenance Support provides repair and installation services for computing systems (including micros) and data communications equipment and facilities, on a contract or time-and-mateials basis.

Installation and Maintenance Support

How can we help?

Installation and Maintenance Support provides the following services to the U of T community:

Maintenance, installation, and expansion of

- IBM PCs (and clones), Macintoshes, MicroVAXes, and related equipment
- modems, multiplexers, and data PBX equipment
- communications data channels (e.g., UTCS Local Data Channels or Bell Canada Provided)
- Local Area Networks (many types)

To use the service, call:

Kam Mark (978-5050).

Location:

4 Bancroft Avenue, Room 103.

Hours of service:

Monday through Friday, 8:45 to 5:00 (or as contracted).

Restrictions on use:

None. Subject to negotiation, services are available to everyone, including external organizations and home locations.

Cost of service:

The costs of standard services are available from Kam Mark.

Just ask us ...

Q: Can you upgrade my personal computer?

A: At your request, we will buy and install additional equipment. The cost of this work is dependent on the actual enhancement; it will be determined by the cost of the parts and labour involved (at $60 per hour).

Q: Will you repair my personal computer even when there isn't a maintenance contract?

A: Repairs will be made as staff are available to work on the problem. The cost for a repair is determined by the time and materials consumed.

Q: My Gandalf LDS125 modem is broken. What can I do?

A: We will replace it for $175 if it isn't on a maintenance contract. Maintenance contracts are available for $60 per year.

For more information about this group, call:

Norman Housley (978-4967).

Systems Support provides system development, management, and operating system support for UTCS-managed computers.

Systems Support

How can we help?

Systems Support provides the following services to the U of T community:

IBM

- installs and maintains the operating system and subsystems on the Administrative and Computing Services mainframes
- administers and manages NetNorth gateway

UNIX

- installs and maintains operating systems on several distributed minicomputers and workstations
- develops, maintains, and administers network resources

To use the service, call:

Bill Lauriston (978-3579).

Location:

McLennan Physical Laboratories, 255 Huron Street, Room 350.

Hours of service:

Monday through Friday, 8:45 to 5:00.

Restrictions on use:

To a great extent, this in an internal UTCS support function.

Cost of service:

Standard UTCS rates apply.

For more information about this group, call:

Bill Lauriston (978-3579).

A view of Bancroft facing Huron.

The State of Even Faster Machines

Terry Sanderson
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On April 10th, Intel announced the i486 microprocessor. Made up of 1.2 million transistors on a piece of silicon measuring 0.27 square inches, it is one of today's two most highly integrated production microprocessors (the other being Motorola's 68040, with about the same number of transistors). With production of the chip expected in the fourth quarter of this year, manufacturers have been scrambling to announce machines based on the new chip.

The i486 microprocessor is essentially the equivalent of an 80386 microprocessor, an 80387 math coprocessor, an 82385 cache controller, and 8KB of data cache, all on a single chip. The major difference between the 80386 and i486 processors is that the i486 has a RISC (Reduced Instruction Set Chip) core, which means that many of the most-frequently-used instructions execute in one clock cycle. Also, since the math coprocessor is on the same piece of silicon as the main processor, the two can be more tightly coupled, providing much-improved floating-point performance.

Intel claims that the new chip will perform 15 to 20 MIPS (millions of instructions per second) at the initial 25MHz clock speed, with a 33MHz version to follow. This means that the i486 will perform between two and four times as fast as a 25MHz 80386/80387 combination, and about 50 times as fast as the original 4.77MHz IBM PC.

The announcement of the i486 follows Intel's February announcement of the i860, a totally new RISC chip that is not based on the 80x86 line of processors. The i860 chip, designed for high-end UNIX workstations and specialty graphics applications, contains over one million transistors. Featuring special 3-D graphics functions in hardware, the 64-bit chip is able to perform 80 MIPS at the initial 33MHz clock speed; future revisions will be capable of running as high as 50MHz. The chip achieves these speeds by being able to perform up to three instructions per clock cycle (one integer instruction, one floating-point addition, and one floating-point multiplication). Many manufacturers have expressed interest in building high-performance workstations with this chip.

So the race continues. The i486 will be in machines by the end of this year, and Intel is calling the i860 "a Cray [supercomputer] on a chip". Will we find a need for this much speed and power? You can bet on it!

IBM Announces 486 Power Platform

Martha Parrott
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In June, IBM beat the rest of the field by announcing i486 processor power for some Personal System/2 users. Due to be shipped at the end of this year, the 486/25 Power Platform board is designed to replace part of the motherboard on the PS/2 Model 70 A21 (a 25MHz, 386-based model). According to IBM, this daughterboard can make your Model 70 A21 run certain types of applications up to three times faster than before. The greatest benefits will be in the areas of CAD/CAM (Computer-Aided Design/Manufacturing), numeric-intensive activities such as financial analysis, and even desktop publishing. Also for this year, IBM is planning a separate 486 machine similar to the Model 70 A21, and possibly other 486 upgrades for Models 60 and 80.

All this power will not be free, of course. IBM has priced the Power Platform daughterboard at $5995, at the same time reducing the cost of a Model 70 A21 by $2700. Educational discounts will apply.

FAX Service Now Available at UTCS!

Patricia Hood
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The UTCS Microcomputer Lab has added FAX (facsimile transfer) to its wide range of services. You can both send and receive FAXes at rates lower than or competitive with off-campus services. (See rate schedule below.) This is a walk-in service that does not require an appointment. The Micro Lab is located at 4 Bancroft Ave., Room 201. Hours of service are Monday through Friday 9:00 a.m. to 6:00 p.m. (exact change only, 5:00 p.m. to 6:00 p.m.). For further information about the FAX service, contact Mary Wilson at 978-5601.

Sending	**1-4 pages**	**Additional pages**
Local	$2.00 per page	$1.00 per page
Canada/USA	$3.00 per page	$2.00 per page
International	$7.00 per page	$5.00 per page
Receiving	**$1.50 per page (any number)**	

Sending FAXes

Transmitting material is an easy four-step process of placing the pages, dialing the number, reading the pages into memory, and transmitting the stored pages. Using the FAX service will be easiest if you prepare yourself, as follows, in advance:

- Know the complete dialing number of your destination (area code, international dial-out codes, etc.).
- Have a record of the correct mailing address of your destination and of a voice number you can call to resolve problems. (UTCS does not provide a voice line for long distance calls.)
- Identify yourself (telephone number, mailing address) and your destination clearly on the first page of your material.

When the transmission is complete, a report will be printed. Take this to the Micro Lab desk, where it will be used to determine the cost of your session.

UTCS is not able to handle oral acknowledgements of your FAX being received at the other end. If you wish an acknowledgement, have the receiver contact you at your home or office.

Receiving FAXes

UTCS will receive FAXed material for you to pick up at your convenience. The FAX number is 978-7159. The charge is $1.50 per page received. If you direct a colleague to transmit material to us, be sure to have him or her include your telephone number on the cover page. This will allow us to contact you if problems arise. Received material will be kept on file for one week; you must pay for it before you read it.

35mm Slides for Macintosh Users

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UTCS now has a hardware device that enables the Macintosh computer to produce presentation-quality graphic output on 35mm slides.

The Liquid Light interface board and the Impress software package allow us to connect a Mac II to our Polaroid Palette film recorder. This allows 35mm slides to be produced from most Mac applications, and full-colour slides from most colour Mac applications.

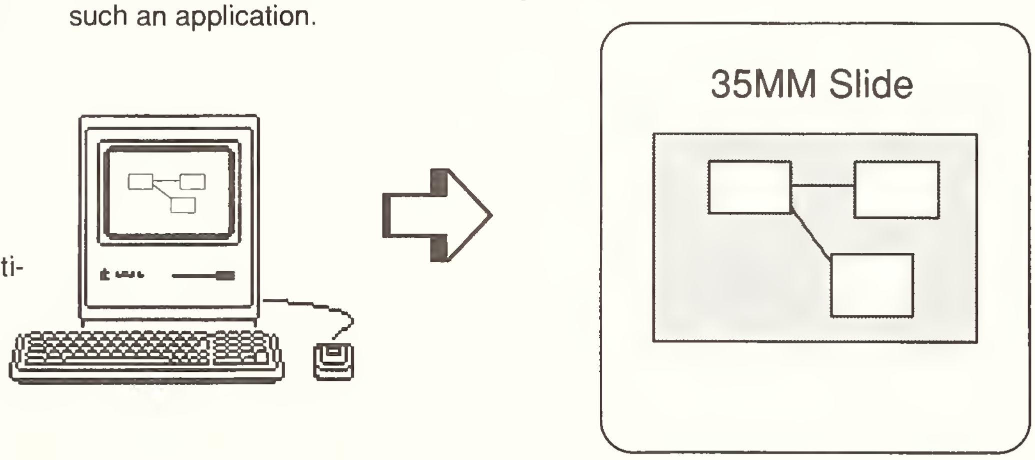
The slide-making software will accept colour PICT-format files, or images cut and pasted into the program. The images to be "shot" are placed in a queue, and the software shoots this queue automatically.

Slide Software

There are a number of Mac applications, including Microsoft Power Point, Cricket Presents, and Aldus Persuasion, that greatly reduce the amount of work needed to produce good, readable slides. Potential slide users should consider acquiring such an application.

For More Information

Users interested in producing 35mm slides should contact Terry Jones at 978-4924 for more information.



Free Electronic Mail Demonstration (NetNorth/BITNET/EARN)

Irene Rosiecki
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Anyone interested in sending mail or documents to colleagues or friends quickly, reliably, and inexpensively will not want to miss this demonstration. We will introduce you to the NetNorth/BITNET/EARN communications network, which is accessible from the CMS system. This network connects more than a thousand universities and research institutes in North America, Europe, and Asia.

The seminar will last just over an hour. Topics will include how to send mail and files to another institution and how to communicate directly with someone on the network. Please note that this is a demonstration, not a hands-on session.

Fall seminars are scheduled for **September 20th, 3-5 p.m.**, and **November 22, 3-5 p.m.**, but space is limited. If you would like to attend one of these free demonstrations, please contact Irene Rosiecki at 978-4565 to reserve a place.

Termination of the UTCS BBS

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Over the last few years, we have seen an explosion of sources for public-domain and freeware software for personal computers. UTCS has two CD-ROM discs crammed with hundreds of files, one for the Macintosh and the other for the PC. There are now over two hundred free or low-cost BBS systems in the Toronto area alone, many offering an excellent selection of files to download. Many BBS systems also have enough people to have discussion groups on various topics. Other BBS systems are connected to world-wide networks like FidoNet, SmartNet, and USENET, permitting discussion groups among many interested individuals. Many campus computers, from personal computers to mainframes, are now connected to other networks like the University NetNorth/BITNET/EARN network, and the Internet, which give us high-speed access to files and discussion groups at other research organizations. Finally, for those who are looking for additional services, commercial BBS systems like Canada Remote Systems ($75 for the first year of service) or Compuserve ($6 per hour) offer hundreds of on-line files to download, discussion groups, access to some of the aforementioned networks, on-line newspapers, on-line databases, on-line shopping, and much more.

Reviewing Our BBS

In reviewing our own BBS, we find that the number of regular users is declining. In addition, we find that a fair bit of our time is going into maintaining the system. Much of our work checking for viruses, copyrighted software, and software utility is duplicated by other BBS services and companies that publish public-domain software on CD-ROM. In fact, many existing BBS services have more resources that we do and hence a much better selection of files.

CD-ROM: A Better Service

It has become clear that we are providing a better service to our users by giving them access to the CD-ROM discs in our Micro Lab, by offering some files through the Advising desk (e.g., the U of T crest), and by providing information on accessing the Internet, NetNorth, CRS, CompuServe, and local BBS systems. It is for these reasons that we have discontinued the UTCS BBS as of September 1, 1989. Users wishing more information, help finding out about other BBS systems, help in getting started with NetNorth or the Internet, or help in locating files that were on the UTCS BBS should contact Advising at 978-HELP.

ProComm Communications Seminar

Irene Rosiecki
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ProComm is a general-purpose communications program currently available to all U of T faculty, staff, and graduate students. It is suitable for connecting to the many networks on campus.

ProComm seminars have been scheduled for **September 20th, 1-3 p.m.**, and **November 22, 1-3 p.m.**.

The various features that will be introduced are terminal emulations (a number of popular ones will be reviewed); the dialing directory; file transfer protocols, such as Kermit and XMODEM; configuration and modem parameter settings; and the DOS gateway, which allows you to execute DOS commands and other programs while you are still in ProComm.

Copies of ProComm are available at no charge to members of the University, but they must bring their own diskettes (two 5.25-inch or one 3.5-inch).

There is a fee for this seminar. To reserve a place, please contact Irene Rosiecki at 978-4565.

VM/SP CMS Upgrade

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In order to keep our IBM VM/SP CMS system current, UTCS is planning to upgrade the VM/SP system from release 4.2 to 5.0 this fall.

There will be a few noticeable changes when this upgrade takes place. The first change that every user will see is the new "logon" screen. It will contain a local banner (or "Logo", as it is called) in the top area of the screen and instructions for entering your userid and password in the bottom area. (You will be able to log on directly from this first screen, unlike the present system where you log on in the second screen.) If you clear this initial screen, you will receive the logon and password prompts from our current 4.2 system.

In the new release, the output from some commands has been improved. Where messages currently appear in uppercase, they will become mixed case; some commands will be reworded to improve readability. For example, if you say QUERY VIRTUAL 500, or Q V 500, today, you might get the message:

```
DMKCQG040E DEV 200
DOES NOT EXIST
```

After the system upgrade, the same command will produce:

```
DMKCQG040E Device 200
does not exist
```

For most people, these improvements should not cause problems, but if you have written programs that rely on the specific format of messages from CP or CMS commands (e.g., ProComm scripts, Rexx execs, etc.), please contact UTCS as soon as possible.

Another effect of the CP upgrade is the addition of many new CMS commands, listed below.

ALARM
CLEAR
CONVERT
CURSOR
DISKMA
DROP
GENMSG
GET
HIDE
ITASK
LANGGEN
LANGMERG
MAXIMIZE
MINIMIZE
MOREHELP
N
P
PARSECMD
POP
POSITION
PRELOAD
PUT
REFRESH
RESTOR
ROUTE
SCROLL
SHOW
SIZE
SNTMAP
SPGEN
SPLOAD
UTILITY
VALIDATE
VMFREMOV
VMFTXT
VMFZAP
WAITREAD
WAITT
WRITE
XMITMSG

If you have written you own CMS commands with the same name as a new CMS command, you will be unable to access the new CMS command.

Among the new CMS commands is one called "ROUTE". UTCS already has a local command called ROUTE; in order to avoid confusion, the UTCS ROUTE command will be renamed "UTSPOOL" this fall.

A few improvements will be seen when the system is upgraded. The CMS "Ready" status message will read:

```
Ready;
```

which is less terse and more informative that the current:

```
R;
```

The VM HELP facility will be enhanced so that users are able to choose from "Brief", "Detail", or "Related" helps when exploring a topic. Also, there will be improvements in the PRINT command.

Exact times for the VM/CMS upgrade and the renaming of the ROUTE command to UTSPOOL will be announced in the LOGON messages. For more information about these changes, please phone 978-HELP.

SAS on the SUN Workstation: An Update

Barry Lay
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For the past year, UTCS has licensed SAS for the SUN workstation, recognizing the need for the support of this popular statistical and data-analysis package in the UNIX arena, and has offered subsidiary licenses based on the SAS Institute's licensing policies.

This year, the SAS Institute has changed its pricing policy for SUN systems, so that owners of SUN/3 workstations will probably see a reduction in price. The current scheme allows for anyone with a SUN/3 workstation of any size to license SAS/BASE, SAS/STAT, and SAS/GRAPH for $150, regardless of the number of users on the station.

These prices are based on the number of licenses we expect to support. Should significant interest be shown for SAS on the SUN, it is likely that subsequent license renewal charges will be lower.

The SNAC group is actively involved in the SAS/UNIX area. If you have any questions, or if you would like to test SAS on our SUN system, please call Barry Lay at 978-6509.

SAS/ETS Now Available for the PC

Barry Lay
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The Econometrics and Times Series group of procedures for the SAS system has been officially released, and is available from UTCS for IBM PCs and compatibles at a cost of $35 per license. This product requires SAS/BASE in order to operate.

SAS/ETS provides procedures for analyzing time-dependent data. While the basic SAS system supports date and time values and formats for a variable, the normal procedures lack the sophistication necessary to handle time-series data properly. Analyzing daily data on a monthly basis, for example, causes problems due to the varying number of days in a month. Such forms of analysis are common in econometrics. Procedures are provided in SAS/ETS for normalizing time-ordered data for a variety of periods, and for interpolating missing intervals.

SAS/ETS has been available for some time on CMS, and has been in beta test for the PC for the past year. With the package's PC release, a number of enhancements have been made. For example, SAS now permits shifted time intervals; this allows a straightforward coding of a fiscal year, where the starting month of the year is not necessarily January. A new procedure, EXPAND, is provided to convert data from one interval to another. In addition to allowing the compression of data from daily to weekly observations, for example, EXPAND can also create new, interpolated observations to expand, for instance, quarterly data to monthly data.

For more information on SAS/ETS, please contact Barry Lay at 978-6509. Those with beta test versions of this software can call to obtain the supported procedures and updates.

Numerical and Scientific Software News

Andrzej Pindor
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Mathematica Demo

We now have demonstration diskettes for Mathematica, for use on both Macintosh and 386-based MS-DOS microcomputers. Mathematica has only recently been ported to MS-DOS machines and is not yet complete. This is reflected in the demonstration diskettes we have: the Macintosh demonstration is much superior to the MS-DOS one!

Everyone is welcome to copy the diskettes or to examine them at UTCS. Please contact Andrzej Pindor at 978-5045 to do so.

MatLab - Public Domain Version for PC

In the January/February issue of *ComputerNews* (#252), I talked about public domain software (and shareware) and mentioned the public domain version of the MatLab program available from APS (see also the July/August 1988 issue of *ComputerNews*, #248). My main complaint was that I could not see a way of reading an ASCII file into the MatLab workspace. Since then, it has been pointed out to me, by Mike Craymer from the University of New Brunswick, that ASCII data can be read into the MatLab workspace using the EXEC("file") command, where "file" stands for the name of the file containing the ASCII data. In fact, this approach to importing ASCII data is used by all current MatLab versions, including the $700 MatLab by MathWorks. Consequently, the public domain version of MatLab may be a very useful alternative to the commercial programs for matrix calculations, although the commercial products also have graphic components with sophisticated features. However, in situations where funds are sparse, the public domain version of MatLab will certainly find use.

MathCAD News

MathSoft Inc., the authors of MathCAD, have announced, in co-operation with Addison-Wesley Publishing Company, a Student Edition of MathCAD. It is based on MathCAD Version 1.1 and has certain limitations. (For instance, the Student Edition scratchpad is only 120 lines by 80 columns.) However, it has a very affordable price: under US$40. It seems like a bargain.

At UTCS, we have MathCAD Version 2.0 in our Microcomputer Lab; anyone interested can examine the software. (We are still awaiting Version 2.5, which is on order.) We also have a MathCAD demonstration diskette for people to examine or to copy for later evaluation.

For further information on any of the products mentioned above, or to arrange a demonstration, contact Andrzej Pindor at 978-5045.

NAg Interactive HELP System on CMS

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Along with the Mark 13 version of the NAg FORTRAN Library (which was installed on the UTCS CMS system in June), we have recently installed the NAg On-line Information Supplement, an interactive HELP system for the NAg Library. It is now available to CMS users.

The NAg Interactive HELP System is based on the University of Cambridge HELP NUMERICAL facility, designed by Philip Hazel and enhanced and maintained by Mike O'Donohoe. This system has been in public use at Cambridge since 1978.

The system (referred to as the "NAGHELP system") is described briefly below, and a sample session is presented to illustrate how it works.

The On-line Information Supplement is intended to serve as an on-line source of information complementing the published FORTRAN Library Manual, though it should not be regarded as a complete replacement for the printed form. On occasion, you will find it necessary to refer to the printed manual for further details, particularly when using sophisticated Library routines with which you are unfamiliar. Nevertheless, the Supplement serves as a free-standing source of information with three main roles:

- to act as an extensive pointer to the range of facilities in the NAg FORTRAN Library and so help you identify Library routines of interest;
- to provide adequate, self-contained documentation of a routine, if it is straightforward to use or if the user is familiar with the subject area and understands the concepts and terms used;
- to serve as a reminder of the role of a particular parameter (argument) or diagnostic message where you have already consulted the full routine documentation.

In fulfilling the above roles, the NAGHELP system provides the following features:

a) a summary of the contents of the current Mark (version) of the FORTRAN Library (the information as a whole will, of course, be updated with each Mark of the Library);

b) advice on the choice of routines in a given subject area;

c) an explanation of terms used in some subject areas; for example, the system will explain what is meant by the "Hessenberg" form;

d) a specification of use of any user-callable routine, under these headings:

- purpose
- formal specification
- parameters (arguments)
- error indicators and warning messages.

The above information is dispensed by the NAGHELP system during the course of your interactive dialogue. The interaction commences with keywords you supply, which the program attempts to match with known keys. If a match is found, the information is retrieved from one or more of its information files. The nature of the information dispensed depends on the context of the matched keys. It can be

- purely informative text;
- a topic menu where the user is invited to choose one or more items for further elaboration;
- a sequence of questions and answers which result in a recommendation of a suitable routine;

or any combination of these.

To use the system, you access the NAg Mark 13 FORTRAN Library and issue the command **NAGHELP**, as illustrated in the sample session below. The text you enter is boldface; the system response is indented.

```
getme nag new
    R; T=0.26/0.35 14:04:14
naghelp
    NAG      NOT IN CP DIRECTORY
     ****************************
     *   NAG HELP PROGRAM        *
     ****************************

    NAG Online Information Supplement: Interactive HELP System.
    FOR HELP TYPE "HELP"; TO QUIT TYPE "BYE/<RETURN>".
    KEYWORD(S)?
help
    For information about this HELP system, type:
    ALL  - for all information
    DOC  - for information on NAG routine documents
    KEY  - for keyword formats
    LOC  - for local and implementation dependent information
    PRN  - for the PRINT command
    PW   - for page waits
    REP  - for repeated keys
    SUBJ - for a start-up menu
    Q    - to re-start
    ?
key
    When you are prompted by the KEYWORDS? line, you should reply with one
    or more keywords for which you want information.
```

/* detailed instructions on keywords omitted here for brevity */

```
    FOR HELP TYPE "HELP"; TO QUIT TYPE "BYE/<RETURN>".
    KEYWORD(S)?
matrix inverse
    MATRIX INVERSION AND OTHER OPERATIONS
```

```
       Do you really need to know explicitly the inverse of your matrix?  Type YES or NO.
       ?
    yes
       The problem can be re-posed as the solution of the matrix equation
               AB = I
       where A is your matrix, B is the required inverse, and I is the unit matrix.  However,
       explicit inversion routines are provided in some cases.

       Is your matrix complex?  Type YES or NO.
       ?
    yes
       Is it also Hermitian and positive definite?  Type YES or NO.
       ?
    yes
       The routine F01BPF finds the inverse of a positive definite complex Hermitian matrix.
       FOR HELP TYPE "HELP"; TO QUIT TYPE "BYE/<RETURN>".
       KEYWORD(S)?
    f01bpf
       F01BPF - NAG FORTRAN ROUTINE SUMMARY
       ======
       IMPORTANT: For a complete specification of the use of this routine see the NAG FORTRAN
       Library Manual.  Terms marked //...// may be implementation dependent.

       (Type LOCAL for any implementation specific comments.)

       A. Purpose
       ==========
        //F01BPF// determines the inverse of a complex positive definite Hermitian  matrix,
       given the lower triangle of the
       matrix.

       B. Specification
       ================
              SUBROUTINE //F01BPF//(N, A, IA, V, IFAIL)
        C     INTEGER                N, IA, IFAIL
        C     //complex//            A(IA,N), V(N)

       C. Parameters
       =============
         1: N - INTEGER.
         On entry, N must specify the order of the matrix A.
         Unchanged on exit.

/* the detailed description of the parameters follows, omitted here for brevity */
       FOR HELP TYPE "HELP"; TO QUIT TYPE "BYE/<RETURN>".
       KEYWORD(S)?
bye
        ******************************
        *  END OF NAG HELP           *
        ******************************
       DASD 31B  DETACHED
       R; T=1.11/1.58 14:06:10
```

People using this system are strongly encouraged to share their experiences with us. Please call Andrzej Pindor at 978-5045 or send e-mail to apindor@vm.utcs.utoronto.ca.

Microcomputer Short Courses

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UTCS offers various noncredit microcomputer courses to faculty, staff, and graduate students of the University of Toronto. These courses cover a number of applications available for the PC or the Macintosh. Whether you will be typing a thesis on a word processor, or working with spreadsheets, databases, or desktop publishing, we may be able to help you get started.

Our class sizes are small, to allow for much individual attention. Continuing support is available upon completion of the course.

The following is a list of the microcomputer courses taught at UTCS:

Introduction to dBASE IV
Introduction to Desktop Publishing
Introduction to Disk Operating System (DOS)
Electronic Mail Seminar
Excel on the Macintosh
Introduction to HyperCard
Introduction to Lotus 1-2-3
Introduction to PageMaker
ProComm Communications Seminar
Introduction to SAS on the PC
Intermediate Applications of SAS on the PC
Microsoft Word on the Macintosh
Microsoft Word on the PC
Introduction to WordPerfect 5.0
Advanced WordPerfect 5.0 Topics
Introduction to WordPerfect 5.0 for 4.2 Users

To find out about course dates and registration procedures, or to book a place in any of these courses, please contact Irene Rosiecki at 978-4565. Courses are filled on a first-come, first-served basis. The more popular courses fill up quickly, but waiting lists are maintained in case of cancellations.

NAg 13

In the previous issue of *ComputerNews,* a few readers enjoyed a good chuckle when NAg, Mark 13, appeared under the heading of "Numerical and Scientific Software for Microcomputers". While the same article did announce the availability of the NAg Workstation Library under Microsoft FORTRAN on a Zenith-AT microcomputer, the Mark 13 upgrade took place on our VM/CMS mainframe system.

1989 SIAM ANNUAL MEETING

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The annual meeting of SIAM (Society for Industrial and Applied Mathematics) was held this year in San Diego, from July 17-21. The program consisted of ten invited lectures, three prize lectures, several special lectures (e.g., The AIDS Epidemic, 1989, by J.W. Curran, director of the AIDS program at the Center for Disease Control, Atlanta), 45 minisymposia on selected topics, and contributed sessions with over 250 presentations. The conference was preceded by a short course on "Signal Processing". There were also special lectures, meetings, and discussions concerning math education.

Invited talks included the following:

- **Parallel Algorithms for Eigenvalue Problem** by Danny C. Sorensen
- **The Geometry of Ill-Conditioning** by James W. Demmel
- **Linear Algebra Problems Arising in Signal Processing** by Jeffrey M. Speiser
- **Displacement Structure of Matrices** by Hanoch Levi-Ari
- **Why Geophysical Inverse Problems Are Really Optimisation Problems** by Robert L. Parker
- **Domain Decomposition Methods for Partial Differential Equations** by Tony F. Chan
- **Iterative Methods for Nonsymmetric Linear Systems** by Thomas A. Manteuffel.

The John von Neuman lecture "On the Foundations of Numerical Computation" was given by Stephen Smale.

Minisymposia

There were two minisymposia on "Developments and Application of New Ideas In Dynamical Systems", where, for instance, a fitting scheme for a single scalar time series, resulting from a multidimensional chaotic dynamical system, was proposed. A central idea of the method is the incorporation of invariant dynamical information from the system into the resulting mapping function. A number of the minisymposia concerned different aspects of linear algebra and its applications in various fields, like optimization, system and control theory, signal processing, and so on. In all of these cases, much attention was paid to methods and algorithms suitable for parallel computers. In fact, the subject of parallel computers seemed to be almost omnipresent. For instance, talks on Partial Differential Equations (PDE's) were dominated by domain decomposition methods, which are said to be particularly suitable for parallel algorithms. Other minisymposia included "Mathematical Aspects of Neural Computing", where various aspects of using neural networks as predictors were discussed, and "Scientific Programming Environments", where enhancements to the C language, to make it more attractive as a tool for numerical and scientific programming, were presented. This minisymposium included a talk by Gaston Gonnet, from the University of Waterloo, on the advantages of Maple, a symbolic programming language, and a talk on "Scientific Visualization". The authors attempted to show how animated pictures with very-carefully-chosen colours, and enhanced by an appropriate acoustic background, can facilitate the visualization of various physical phenomena. Unfortunately, sophisticated and expensive equipment supplied by SIAM for the presentation failed, to the great embarrassment of the authors and organizers. The show finally took place about twenty minutes later, thanks only to the fact that the authors brought their own, much simpler, equipment. Another minisymposium discussed modelling the epidemiology of AIDS.

Book and Software Exhibition

The conference was accompanied by an exhibition of book publishers and software vendors. There were several books on fractals, and the American Mathematical Society offered several videotapes on various mathematical subjects, including one on fractals: "Chaos, Fractals and Dynamics: Computer Experiments in Mathematics", by Robert Devaney. There was also a videotape on Mathematica software: "Introducing Mathematica", by Stephen Wolfram. Mathematica software was prominently displayed. A further item of interest was the announcement of the Student Edition of MathCAD (for details, see "Numerical and Scientific Software News", in this issue).

If you are interested in examining the program of the conference and/or abstracts of the talks, please call Andrzej Pindor at 978-5045.

Enhancing Our Understanding: "The Dynamic Text" Conference

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Humanists from around the world gathered in Toronto from June 5th to 9th for the first joint conference of the Association for Literary and Linguistic Computing (ALLC) and the Association for Computing and the Humanities (ACH). Over 400 people attended this conference, entitled "The Dynamic Text".

The purpose of the conference was to explore how computers enhance our understanding and creation of our intellectual and cultural heritage. It was sponsored in part by IBM, and organized by the Centre for Computing in the Humanities here at the University of Toronto. UTCS contributed personnel and hardware to the running of the software fair and the conference itself. Lidio Presutti, in particular, helped to ensure that every presenter had the appropriate hardware.

At the conference, there were talks on subjects as diverse as text analysis with computers, computers in archaeology, and language instruction with computers. Two especially popular topics were hypertext and hypermedia. Hypertexts are works created for the computer that combine text, graphics, and sound; they are webs of information that may include portions of other texts or other media. Ted Nelson, who coined the term "hypertext", arrived unannounced to address the conference attendees, and presenters from Brown University demonstrated their hypermedia system, "Intermedia". (For more information on the talks given, a conference guide called "The Dynamic Text", edited by Ian Lancashire, can be obtained from the Centre for Computing in the Humanities.)

A software (and hardware) fair, at which exhibitors displayed products of interest to humanists, ran throughout the conference. ("Tools For Humanists", the software fair guide, edited by Willard McCarty, is available from the Centre for Computing in the Humanities.) I spent my time at the fair showing BIB — a bibliographic HyperCard stack for the Macintosh — and learning about the tools others had created.

Elli Mylonas from Harvard demonstrated the Perseus project, a collection of electronic information on Ancient Greek civilization, including the complete texts of many classical authors, as well as colour pictures of ancient sites in Athens. Three different Hypercard stacks for Japanese instruction were demonstrated, including KanjiCard, which was created here at U of T by members of the East Asian Department.

WordCruncher, a text-indexing program, was displayed at the fair, and UTCS' John Bradley presented similar software, called TACT, which was distributed to all the attendees at the conference. TACT, jointly developed by John Bradley and Lidio Presutti, is a sophisticated text-retrieval system that allows researchers to do complicated searches within texts they have prepared in advance.

Two large textual databases were demonstrated: the Dante project from Brown University, and the ARTFL project from Chicago. Both offer electronic access to complete texts — the Dante project to works by Dante, and ARTFL to French texts of the 17th to 20th centuries.

The week before and the week after the conference, computer-related courses were offered through the Toronto-Oxford Summer School in Humanities Computing. These courses, several of which were given by UTCS staff, ranged from *Programming in SNOBOL4* to *Computational Approaches to the Study of Reader Response.* I taught a Hypercard course, developed with assistance from Apple Canada.

By all accounts, the conference was a success. The attendance, as well as the quality of the talks, indicates that computing in the Humanities is a growing field. More and more, humanists are using computers in their research and teaching.

The next joint conference will be held in Siegen, Federal Republic of Germany, from June 5th to 9th, 1990.

For more information, or for copies of the conference guide and software guide, contact the Centre for Computing in the Humanities.

Centre for Computing
in the Humanities
University of Toronto
Robarts Library, Room 14297A
130 St. George Street
Toronto, Ontario
M5S 1A5
Canada

Tel. (416) 978-4238
FAX (416) 978-6519

The two books are available for $15 each. Postage and handling is $3.50 per book.

Documents at UTCS

All vendor-produced documentation may be ordered through the UTCS Information Office, Room 201, 4 Bancroft Avenue. UTCS documents and selected vendor documents are also stocked there for purchase. For more information on prices, call Dale Wright at 978-4990. Whenever feasible, documents are made available online, and users are encouraged to print their own copies. On the VM machine, a special command has been provided for this purpose.

To print online documents on:

IBM VM/CMS	***GP UNIX***
Type "help document"	Use *ipr* command

The following examples relate to the table below. The document to be printed is the UTCS Guide to Census Tapes, called CENSUS LISTING on CMS and /usr/doc/utcs/census on GP UNIX. <RETURN> means RETURN or ENTER key.

```
CMS:      document <RETURN> <RETURN>
          laser census listing (forms yxle <RETURN>

GP UNIX:  nohup ipr -8p -fyxle /usr/doc/utcs/census & <RETURN>
```

UTCS Documents in hardcopy

New:

Previously announced:

Academic's Guide to Microcomputer Systems
Character Sets for Highspeed Printing
UTCS GUIDE TO PRODUCTS AND SERVICES: Introduction
UTCS GUIDE TO PRODUCTS AND SERVICES: Basics
UTCS GUIDE TO PRODUCTS AND SERVICES: Accounting
UTCS Catalogue: Numerical Products
UTCS Catalogue: Statistics Products
UTCS Catalogue: Text Products
UTCS Guide to Census Tapes
UTCS Guide to Kermit
UTCS Guide to Micro File Transfer Service
UTCS Guide to Text Processing on GP UNIX

UTCS Documents online

	CMS LISTING	GP UNIX	Forms Code
New:			
Previously announced:			
UTCS GUIDE TO PRODUCTS AND SERVICES: Introduction	INTRO	/usr/doc/utcs/intro	*
UTCS GUIDE TO PRODUCTS AND SERVICES: Basics	BASICS	/usr/doc/utcs/basics	*
UTCS Catalogue: Access, Part 1	ACCESS1	/usr/doc/utcs/access1	*
UTCS Catalogue: Access, Part 2		/usr/doc/utcs/access2	*
UTCS Catalogue: Numerical Products	NUMCAT		*
Product-Function List	NUMLIST		BXQD
UTCS Catalogue: Statistics Products	STATCAT		*
Product-Function List	STATLIST		BXQD
UTCS Catalogue: Text Products	TEXTCAT	/usr/doc/utcs/textcat	*
UTCS Guide to BMDP	BMDP		*
UTCS Guide to Census Tapes	CENSUS	/usr/doc/utcs/census	*
Recipes for Using Tapes on VM/CMS	QUIKTAPE		*
UTCS Guide to FORTRAN on VM/CMS	FORTRAN		*
UTCS Guide to GP UNIX		/usr/doc/utcs/gpunix	*
UTCS Guide to Highspeed Printing	PRINT	/usr/doc/utcs/print	*

** Recommended forms code for the 8700 is YXLE unless otherwise stated.*
† Use the 87set command. Type "help 87set".

Documents continued

UTCS Documents online continued

	CMS LISTING	GP UNIX	Forms Code
UTCS Guide to Kermit	KERMIT	/usr/doc/utcs/kermit	*
UTCS Guide to Micro Laser Printing Service	MICRLASR		*
UTCS Guide to SAS	SAS		*
UTCS Guide to SCRIBE	SCRIBE		*
(For printing instructions, see page 1 of document)			
UTCS Guide to Series/1 Terminal Use	SERIES		*
3270 Emulation:			
Cybernex APL100 and Volker Craig VC404	CYBER		*
DM1520	DM1520		*
Hardcopy Terminal	HARDCOPY		*
IBM 3101	IBM3101		*
IBM PC Kermit	PCKERMIT		*
SOROC IQ	SOROC		*
VT52	VT52		*
VT100	VT100		*
UTCS Guide to SPSS	SPSS		*
UTCS Guide to Text Processing on GP UNIX		/usr/doc/utcs/text	YXOG
UTCS Guide to TFW.MAK in SCRIBE	TFWMAK		*
UTCS Guide to VM/CMS	CMSGD		*
UTCS Guide to WSCRIPT	WSCRIPT		*
UTCS Rate Schedule (Commercial)	RATESCOM		†
UTCS Rate Schedule (External)	RATESEXT		†
UTCS Rate Schedule (Internal)	RATESINT		†

Other Documentation online

Electronic Mail			
A User's Guide to Electronic MAIL	MAILBOOK		YXOC
Kermit			
Kermit Protocol Manual	KERMITPM		YXOE
Kermit User Guide	KERMITUG		YXOF
ProComm			
ProComm Reference Manual	PROCOMM		YXOE
VMBATCH Documents			
VMBATCH User's Guide	VMBATCH		YXOA
VMBATCH Messages and Codes	VMBATMC		YXOA
VMSECURE			
VMSECURE User's Guide	VMSECURE		YXOE
VM Tape Documents			
TapeMap User's Guide and Reference	TAPEMAP		*
VMTAPE Messages and Codes	VMTMSGS		YXOE
VMTAPE User's Guide	VMTUSER		YXOE
Waterloo SCRIPT			
Reference Manual	WSCRPTRF		YXLC
User's Guide	WSCRPTUG		YXLC
Using SCRIPT in MVS/TSO	WSCRPTSO		YXLC
Waterloo SCRIPT and a PostScript Printer	WSCRPTPS		YXLC
Formula Processor Summary	WSCRPTFP		YXLC
GML User's Guide	GMLUG		YXLC
GML Reference Summary	GMLRFSUM		YXLC

** Recommended forms code for the 8700 is YXLE unless otherwise stated.*
† Use the 87set command. Type "help 87set".

Consulting and Enquiries

Applications Support & Advising Supervisor	Alex Nishri	BC214	978-7109
External Marketing Consultant	Ihor Prociuk	BC217	978-6875
Erindale College	Joe Lim	ER2035	828-5311
Information Office	Dale Wright	BC201	978-4990
Account & Access Code Enquiries	Sylvia May	BC101B	978-7148
IBM PC Maintenance	Kam Mark	BC103	978-5050
Tape Library (Academic Services)	Susan Kovago	MP368	978-7319
Tape Library (Administrative Services)	Miranda Fong	MP368	978-6693
Terminal Service	Rosi Tseu	BC105	978-7087
UTCS Noncredit Short Courses	Irene Rosiecki	BC217	978-4565

Consulting & Advising Services:	978-HELP
CMS, and GP UNIX userids:	ADVISOR
CMS Userid for mail problems:	POSTMSTR
System Status Enquiries (GP UNIX)	978-4318
System Status Enquiries (IBM)	978-7393
Interactive Services 300 (bps)	978-3959
Interactive Services 1200 (bps)	978-3959
Interactive Services 2400 (bps)	978-7239

UTCS Directory

Director:	Dr. Warren Jackson	BC118	978-8948	wcj@vm.utcs.utoronto.ca
Associate Director:	Eugene Siciunas	BC116	978-5058	eugene@vm.utcs.utoronto.ca
Managers:				
Communications &Technical Support	Norman Housley	BC121B	978-4967	norman@vm.utcs.utoronto.ca
Information Centre	Don Gibson	BC217	978-7331	don@vm.utcs.utoronto.ca
Internal Systems Support	Ron Vander Kraats	BC121A	978-4428	rvk@vm.utcs.utoronto.ca
Operations Support	Dr. Bob Chambers	MP350	978-7092	
Systems Support	Bill Lauriston	MP331	978-3579	bill@vm.utcs.utoronto.ca

Committees on Computing

Supercomputer Users' Group at U of T	Chair	Prof. W.R. Peltier	978-2938
Research Board Standing Committee on Computing	Chair	Prof. C.C. Gotlieb	978-2986

Legend

BC = Bancroft Building
ER = Erindale
MP = McLennan Physical Labs

* NetNorth/BITNET/EARN

UTCS Terminal and Advising Sites

Names and Locations

Central Advising Office (CAO), 978-HELP
Engineering Annex (EA, CDF), 11 King's College Road, Rooms 103, 107, 107B, 201, 203
Erindale College (Erin), 828-5339, Mississauga Road, Erindale Campus, Rooms 2037, 2039A-B-C, 2045
Robarts, Robarts Library, 130 St. George St., Room 1061A
Sidney Smith (Sidney), 100 St. George St., Rooms 1071, 2105
St.Michael's College, 121 St. Joseph St., Room 107
Trinity College, 6 Hoskins Ave., Room 024
Victoria University, 73 Queens Park Cres., Room 208

Access Hours

Sites	Hours of Access				Restrictions*	Advising
	Mon-Thurs	Fri	Sat	Sun		
CAO	10:00-18:00	10:00-18:00	closed	closed	Research	978-HELP
CDF	24 hrs	24 hrs	24 hrs	24 hrs	Undergrads	No
EA	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Erin (2039)Δ	9:00-17:00	9:00-17:00	12:00-16:00	12:00-16:00	Research	Rm 2005
(2045-46-47)	24 hrs	24 hrs	24 hrs	24 hrs	Undergrads	Rm 2005
(235)†	8:00-22:00	8:00-17:00	closed	closed	None	Rm 2046
Robarts	8:30-24:00	8:30-24:00	9:00-22:00	13:00-22:00	None	978-HELP for Research
Sidney	7:00-24:00	7:00-24:00	7:00-24:00	7:00-24:00	None	978-HELP for Research
St.Michael's	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Trinity	8:00-22:00	8:00-22:00	8:00-22:00	8:00-22:00	None	978-HELP for Research
Victoria	8:30-21:00	8:30-21:00	8:00-13:00	8:00-13:00	None	978-HELP for Research

Sites	Advising Hours
CAO	Monday through Friday, 10:00 - 18:00
Erin	Monday through Friday, 09:00 - 22:00

Legend

* Research includes graduates, faculty, staff.
Δ Key access available.
† Access restricted to building hours.

Computer and Printer Access

Sites	PACX	Printers	CDF/PC Microcomputers
CDF	N	Y	N
EA	Y	Y	N
Erin	Y	Y	N
Robarts	Y	Y	Y †
Sidney	Y	Y	Y††
St.Michael's	Y	Y	Y††
Trinity	Y	Y*	Y††
Victoria	Y	Y*	Y††

(Y=yes, N=no)

* CDF/PC only † NEC †† TI/PC

UTCS Services

UTCS Centrally Owned and Managed

Systems

IBM VM/CMS
Technical Assistance: 978-6602

- General Purpose Timesharing environment
- Hub of the NetNorth network with access to BITNET, EARN and the Internet
- 4381-R02 processor with 32 megabytes of memory
- CP operating system, VM/SP HPO R4.2
- CMS timesharing system, VM/SP Release 4
- FTP and TELNET access to the campus ethernet, as well as Internet
- RSCS spooling system, Release 2.3

GP UNIX
Technical Assistance: 978-8853

- General Purpose Timesharing under SUN UNIX 3.2
- SUN 3/280, 8 megabytes of memory
- access to Linotronic typesetter
- offers a sophisticated and powerful environment for text processing
- offers a sophisticated programming environment suitable for commercial software development or testing
- full access to USENET, an electronic technical information exchange facility
- offers excellent electronic mail facilities and ability to send or receive mail from most computer networks worldwide, such as UUCPNET, ARPANET, NetNorth, BITNET, CSNET, CDNNET

Services

Communications & Technical Support
Primary Phones: 978-3787, 978-4967

- Communications Group provides communications systems, terminals, modems, data channels: consulting and installation.
- Field Service Group installs and maintains communications and computer systems, particularly IBM PCs, Micro Vaxes, and Macintoshes, on a contract basis or on a cost-per-call basis.
- provides consulting on computer systems technology and installs computer systems
- provides access between the IBM systems and machines using UNIX, VMS and other operating systems. Ethernet, Pronet, and IBM TRN technologies are used over various transmission media including optical fibre. More basic communications techniques are also used for moderate speed links.
- provides consulting on local area networking and installs LANS
- provides access to NetNorth (BITNET), the North American Universities Network; ONET, the Ontario Regional Network; and USENET, the UNIX networking fraternity
- provides gateway to the US Internet
- will provide a communications solution to department needs on a contractual basis

Information Centre
Primary Phone: 978-HELP

- Provides assistance in use of electronic messaging, including use of Local Area Networks (LANS); NetNorth/BITNET/EARN, the world Universities network; CDNNET, the Canadian X.400 network; ARPANET; CSNET; USENET; and other international connections.
- provides advising, consulting and documentation on:
  - command languages, including CMS and UNIX
  - high level languages, including FORTRAN, and PL/I
  - packages and libraries, including SAS, SPSS, BMDP, IMSL, and NAg
  - editors and formatters, including XEDIT, ed, nroff/troff
- provides general micro support
  - selection consulting for hardware and software
  - Micro Lab for evaluation of hardware and software
  - advice on University discounts
  - media conversion and data transfer
  - CD-ROM access to software and information discs
  - offers Micro Laser Printing Service
  - offers 35mm slide production service using Polaroid Palette
  - administers Local Area Network of PCs for Education Facility
  - administers Macintosh Education Facility
- high quality typesetting
- installs and maintains application packages
- administers site licenses for various software packages
- provides short courses and seminars on the more popular services and software packages

> *The mandate of UTCS is to encourage and support the use of information technologies across campus, and to plan, implement, and operate common-carrier networks and certain appropriate central computer facilities.*

Facilities Managed by UTCS

Administrative Computing

- administrative IMS, DB2, Batch, and TS0
- 3081K processor, 48 megabytes of memory
- MVS/XA operating system

Computer Disciplines Facility/UNIX

SUN 3/280s, 16 megabytes of memory (zero.cdf)
- Computer Science interactive access
- SUN UNIX 4.0.3

SUN 3/280s, 16 megabytes of memory (one.cdf)
- Computer Science interactive access
- SUN UNIX 4.0.3

Computer Disciplines Facility/PC

- 40 NEC computers connected in a Local Area Network
- 66 TI Professional Computers connected in a Local Area Network
- introductory Computer Science instruction
- MS-DOS with Turing environment

Erindale College Systems

VAX 8200, 8 megabytes of memory
- instructional access using VMS
- research access

VAX-11/750, 5 megabytes of memory
- instructional access using UNIX (Berkeley UNIX 4.3BSD)

Institutional Relations System

VAX-11/750, 8 megabytes of memory
- database services to the owner departments using VMS

EPAS Facility

- 4361-5 processor, 16 megabytes of memory
- general VM/CMS services to the owner departments

Ontario Centre for Large Scale Computation (OCLSC)

- Cray Research Inc. X-MP/24
- 2 processors, 4 megawords main memory
- solid state disk (SSD) with 64 megawords of storage
- COS 1.17 operating system
- VAX 8350 + MicroVAX II and VAX750 provide VMS front-end services

Software List

SOFTWARE LIST for MICROCOMPUTERS

The following are microcomputer software packages for which UTCS can provide either support or some information. As with mainframe products, micro packages receive full support (Class A), limited support (Class B), or no active support (Class C). The specific criteria differ from those for mainframe classes and are outlined in the Academic's Guide to Microcomputer Systems.

Package/Compiler	Version	Environment	Support
Application Development Tools			
Assembler			
Microsoft Assembler	5.1	MS-DOS 3.3 & OS/2	B
MPW Assembler	2.0.2	Macintosh	B
BASIC			
GW BASIC	—	MS-DOS	B
C			
Microsoft C	5.1	MS-DOS	B
MPW C	2.0.2	Macintosh	B
WATCOM C & Express C	6.0	MS-DOS	B
FORTRAN			
IBM FORTRAN/2	1.0	MS-DOS 3.3 & OS/2	B
Language Systems FORTRAN	1.0	Macintosh	C
Microsoft FORTRAN	4.0	MS-DOS	B
WATCOM WATFOR-77	3.0	MS-DOS	A
Pascal			
MPW Pascal	2.0.2	Macintosh	C
TURBO Pascal	—	MS-DOS	B
Tools			
ResEdit	1.2d0	Macintosh	B
HyperCard	1.2.1	Macintosh	A
Macintosh Programmer's Workshop	2.0.2	Macintosh	B
WATCOM GKS	1.3	MS-DOS	B
Communications			
File Transfer & Terminal Emulators			
Kermit	0.8(35)	Macintosh	A
Kermit	2.30	MS-DOS	A
Kermit	—	Apple II DOS	C
Kermit	—	CP/M	C
DeskLink	2.21c	MS-DOS	B
Lap-Link Mac	2.0	Macintosh	B
Lap-Link PC	2.16	MS-DOS	B
MacTerminal	2.2	Macintosh	B
PC TALK3	—	MS-DOS	C
PC PLOT III	—	MS-DOS	C
ProComm	TU 2.4.2	MS-DOS	A
Red Ryder	10.3	Macintosh	B
Remote^2	1.01	MS-DOS	B
Network Systems			
AppleShare	2.0.1	Macintosh	B
Novell Advanced Netware	2.0a	MS-DOS	B
STARLAN	3.1	MS-DOS	B
TOPS	2.1	Macintosh	B
TOPS	2.1	MS-DOS	B
Network System Utilities			
Inter•Poll	1.0	Macintosh	B
Database Managers			
4th Dimension	Int. 1.03	Macintosh	B
Archivist	1.02b	MS-DOS	B
AskSam	3.03	MS-DOS	B
Clipper	S87	MS-DOS	B
DATAEASE	2.5R3	MS-DOS	B
dBASE IV	1.0	MS-DOS	A

Software List continued

Package/Compiler	Version	Environment	Support
FoxBASE Mac	2.0	Macintosh	B
Notebook II	2.03	MS-DOS	C
Desktop Publishing			
Fontographer	n/a	Macintosh	C
PageMaker	3.01	Macintosh	A
PageMaker	3.0	MS-DOS	A
Ready Set Go	4.0	Macintosh	C
Ventura	2.0	MS-DOS	B
XPress	1.0	Macintosh	C
Electronic Mail			
Microsoft Mail	1.36	Macintosh	B
QuickMail	1.0	Macintosh	B
Graphics			
Charting			
35mm Express	4.02	MS-DOS	B
Cricket Graph	1.2	Macintosh	C
Freelance Plus	3.0	MS-DOS	B
Harvard Graphics	2.1	MS-DOS	B
Lotus 1-2-3	2.01a	MS-DOS	B
Microsoft Excel	1.5	Macintosh	B
Microsoft Excel	2.0	MS-DOS	B
SigmaPlot	—	MS-DOS	C
Draw and CAD			
Aldus Freehand	1.0	Macintosh	B
Cricket Draw	1.1	Macintosh	C
Generic CADD	3.0	MS-DOS	C
MiniCad	4.05	Macintosh	C
Illustrator	1.0	Macintosh	B
Illustrator88	1.6	Macintosh	B
MacDraft	1.2b	Macintosh	C
MacDraw	1.95	Macintosh	A
MacDraw II	1.0v1	Macintosh	B
Windows Draw	1.02	MS-DOS	C
Image and Scanning			
Corel Draw	1.00	MS-DOS	B
ImageStudio	1.05	Macintosh	B
Publish Pac	2.0	Macintosh	B
Publish Pac	2.1	MS-DOS	B
Text Pac	2.0	MS-DOS	B
Paint			
DR HALO	1.23	MS-DOS	C
MacPaint	2.0	Macintosh	A
Microsoft Paintbrush	2.0	MS-DOS	C
PC Paintbrush	2.5	MS-DOS	C
SuperPaint	1.1	Macintosh	B
Windows Paint	2.03	MS-DOS	C
Plotting Subroutines			
WATCOM GKS	1.3	MS-DOS	B
Numerical			
Derive	1.14	MS-DOS	C
Eispack	n/a	MS-DOS	C
Eureka	n/a	MS-DOS	C
GAUSS	2.0	MS-DOS	B

Software List continued

Package/Compiler	Version	Environment	Support
Linpack	n/a	MS-DOS	C
MathCAD	2.0	MS-DOS	C
muMATH-83	4.12	MS-DOS	C
NAg Workstation Library	Rel. 1	MS-DOS	A
Solver-Q	---	MS-DOS	C
Operating Systems			
IBM PC, PS/2, and compatibles			
AIX PS/2 (Unix)	1.1	n/a	C
IBM OS/2 Extended	1.1	n/a	B
IBM PC-DOS	4.0	n/a	B
Microsoft MS-DOS (incl IBM PC-DOS)	3.3	n/a	A
Microsoft Windows 286	2.1	MS-DOS	A
Microsoft Windows 386	2.1	MS-DOS	A
Macintosh II, Macintosh SE, and Macintosh Plus			
A/UX (Unix)		n/a	C
Finder	6.1	n/a	A
MultiFinder	6.0.1	n/a	A
System	6.0.2	n/a	A
NeXT			
NeXT	0.9	n/a	B
Apple II			
Apple II DOS	3.3	n/a	C
CP/M	2.20	n/a	C
ProDos	1.0	n/a	C
Sound			
SoundWave	1.0	Macintosh	B
MacRecorder	1.0	Macintosh	B
Spreadsheet			
HAL	1.0	MS-DOS	B
Lotus 1-2-3	2.01a	MS-DOS	B
Microsoft Excel	1.5	Macintosh	B
Microsoft Excel	2.0	MS-DOS	B
Statistical			
BASS	88.10	MS-DOS	C
MACSPIN	1.5	Macintosh	C
Minitab	82.1.1	MS-DOS	C
PowerStat	1.04	MS-DOS	C
SAS/PC	6.03	MS-DOS	A
SPSS/PC+	3.0	MS-DOS	A
STATPRO	2.0c	MS-DOS	C
STATWORKS	1.2	Macintosh	B
SYSTAT	3.2	Macintosh	B
SYSTAT	3.2	MS-DOS	B
Word Processing			
Guide	2.0	MS-DOS	C
FinalWord II	2.0	MS-DOS	C
MacWrite	5.01	Macintosh	B
Manuscript	2.0	MS-DOS	C
Microsoft Word	3.01	Macintosh	A
Microsoft Word	4.0	MS-DOS	A
Nota Bene	3.0	MS-DOS	B

Software List continued

Package/Compiler	Version	Environment	Support
Nota Bene SLS	3.0	MS-DOS	B
PC-TeX	2.1	MS-DOS	B
Sprint	1.0	MS-DOS	B
T^3	—	MS-DOS	C
WordPerfect	4.2 & 5.0	MS-DOS	A
WordPerfect	1.0	Macintosh	C
WordPerfect Library	2.0	MS-DOS	C
WordStar	3.3	MS-DOS	C
Utilities			
Apple Turnover	—	MS-DOS	A
Fastback MAC	2.0	Macintosh	B
Fastback Plus	2.0	MS-DOS	B
Norton Utilities	4.5	MS-DOS	A
Copy II MAC	7.2	Macintosh	B
Mace Utilities	4.10	MS-DOS	B
MacZap	5.1	Macintosh	B
Sidekick	—	MS-DOS	C
TURBO Lightning	—	MS-DOS	C
XenoCopy PC	1.117	MS-DOS	A

SOFTWARE LIST for MAINFRAME COMPUTERS VM/CMS, UNIX

Each programming language or package available at UTCS has a support level. In general, Class A Products receive full support, Class B limited support (as time and resources allow), Class C no active support.

For complete details of UTCS product support policy, see the UTCS GUIDE TO PRODUCTS AND SERVICES: Introduction.

Package/Compiler	System	Support	Version
Communications			
FTP	VM/CMS	C	1.2.1
Kermit	VM/CMS	A	---
Kermit	UNIX	B	4C(058)
FTS	VM/CMS	A	---
MAIL/MAILBOOK	VM/CMS	A	86.359
MICROLASER	VM/CMS	A	---
macget/macput	UNIX	C	---
netcopy, netexec, to (NetNorth Tools)	UNIX	B	---
xmodem	UNIX	C	---
ftp,rsh,rlogin,telnet,rcp (Access via TCP/IP to most of the networked machines on all three campuses)	UNIX	B	---
rn/Pnews	UNIX	B	---
mail,mh,Mail	UNIX	-	---
TELNET	VM?CMS	C	1.2.1
Graphics			
PLOTBASIC (FORTRAN)	VM/CMS	C	---
SAS/GRAPH	VM/CMS	A	5.18
Languages			
ASSEMBLER(F)	VM/CMS	C	---
Concurrent Euclid	VM/CMS	C	1.9
FORTUTILS	VM/CMS	A	2.2
PL/I OPT Compiler	VM/CMS	B	1.5.1
REXX	VM/CMS	A	---
SNOBOL 4	VM/CMS	C	3.5
Turing	VM/CMS	C	---
VS FORTRAN	VM/CMS	A	1.4.1
VS Pascal	VM/CMS	C	2.2
Waterloo C	VM/CMS	C	1.3
WATFIV	VM/CMS	C	V2L0
WATFOR-77	VM/CMS	A	1.3
cc	UNIX	A	---
f77	UNIX	C	---
ratfor	UNIX	C	BSD std.
ttc	UNIX	C	---
pc	UNIX	C	BSD std.
yacc	UNIX	C	---
awk	UNIX	C	---
adb,dbx	UNIX	C	BSD std.
Numerical			
IMSL	VM/CMS	A	9.2,10.0
LINPACK	VM/CMS	C	---
MINOS	VM/CMS	C	5.1
MINPACK	VM/CMS	C	---
NAg	VM/CMS	A	Mark 11, 13
Statistical			
BMDP	VM/CMS	A	Level 85, Level 87
Minitab	VM/CMS	B	5.1
NAg	VM/CMS	A	Mark 11, 13
NTSYS	VM/CMS	C	1987
SAS	VM/CMS	A	5.18
SPSS^{x}	VM/CMS	A	3.1

Package/Compiler	System	Support	Version
Text Processing			
SCRIBE	VM/CMS	C	4(1400)-1
Waterloo SCRIPT	VM/CMS	B	86.1
XEDIT	VM/CMS	A	---
8700 Pseudotypesetting	VM/CMS	C	n/a
MICROLASER	VM/CMS	A	---
ed	UNIX	A	---
vi	UNIX	C	---
cmacs	UNIX	C	---
spell	UNIX	C	---
diction/explain	UNIX	C	---
eqn	UNIX	B	---
tbl	UNIX	B	---
pic	UNIX	C	---
troff	UNIX	B	---
nroff	UNIX	B	---
TeX	UNIX	C	---
Utilities			
FORTUTILS	VM/CMS	A	2.2
TPRINT	VM/CMS	C	---
TCOPYNL	VM/CMS	B	---
TCOPYSL	VM/CMS	B	---
crypt	UNIX	A	BSD std.
compress	UNIX	C	BSD std.
csh	UNIX	B	BSD std.
diff	UNIX	A	BSD std.
grep	UNIX	A	BSD std.
ipr	UNIX	B	---
learn	UNIX	C	BSD std.
patch	UNIX	C	---
sed	UNIX	A	BSD std.
sort	UNIX	A	BSD std.
sh	UNIX	A	BSD std.
tar	UNIX	A	BSD std.
uniq	UNIX	A	BSD std.

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